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Personnel Qualification

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ENIQ RECOMMENDED PRACTICE 10:

PERSONNEL QUALIFICATION

June 2010 *ENIQ Report nr. 38* *EUR 24112 EN*

ENIQ, the European Network for Inspection and Qualification, publishes three types of documents:

Type 1 — **Consensus documents**
Consensus documents contain harmonised principles, methods, approaches and procedures and emphasize the degree of harmonisation between ENIQ members.

Type 2 — **Position/Discussion documents**
Position/discussion documents contain compilations of ideas, express opinions, review practices, draw conclusions and make recommendations for technical projects.

Type 3 — **Technical reports**
Technical reports contain results of investigations, compilations of data, reviews and procedures without expressing any specific opinion or evaluation on behalf of ENIQ.

The present document “ENIQ Recommended Practice 10: “Personnel qualification” (ENIQ Report nr. 38) is a Type 1 document.

FOREWORD

The present work is the outcome of the activities of the ENIQ Task Group Qualification (TGQ).

ENIQ, the European Network for Inspection and Qualification, was set up in 1992 in recognition of the importance of the issue of qualification of NDE inspection procedures used in in-service inspection programmes for nuclear power plants. Driven by European nuclear utilities and managed by the European Commission Joint Research Centre (JRC) in Petten, the Netherlands, ENIQ was intended to be a network in which available resources and expertise could be managed at European level. It was also recognised that harmonisation in the field of codes and standards for inspection qualification would be a major advantage for all parties involved, and would ultimately increase the safety of European nuclear power plants. More information on the ENIQ network and its activities can be found at http://safelife.jrc.nl/eniq/.

ENIQ work is carried out by two sub-groups: the Task Group on Qualification (TGQ) focuses on the qualification of in-service inspection (ISI) systems, and the Task Group on Risk (TGR) focuses on risk-informed in-service inspection (RI-ISI) issues. The TGQ has published the European Methodology Document for qualification of non-destructive testing, and is producing more detailed recommended practices and discussion documents on several inspection qualification specific issues.

This ENIQ recommended practice is meant to assist those involved in the qualification of inspection personnel to meet the principal objective of personnel qualification, i.e. to ensure that those carrying out an inspection are appropriately trained, experienced and examined to ensure it is applied correctly and effectively. Detailed guidance on how to conduct personnel qualification, handle qualifications to be renewed, and defining the role and responsibilities of the parties involved in the personnel qualification process is provided. It is however well recognised by ENIQ that the latter is organised quite differently in different countries, and experiences gained by applying this document on national level will be taken into account in the next revision.

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1 Introduction

The European Methodology Document [1] is intended to provide a general framework for development of qualifications for the inspection of specific components. The aim is to ensure that qualifications are developed in a coherent and consistent way, while still allowing them to be tailored in detail to meet different national requirements. For this reason, the European Methodology Document does not contain a detailed description of how the inspection of a specific component should be qualified.

A recommended practice is a document produced by ENIQ to support the production of detailed qualification procedures by individual countries. A recommended practice is the next level of document below the methodology and is applicable in general to any qualification. This general scope means that valuable advice can be given by ENIQ to promote a uniform approach to qualification but the detail of how qualification is to be done is determined at the national level in line with the regulatory and technical requirements in that country. Organisations are free to make use at national level of the existing recommended practices, as they see fit.

This document provides recommendations for the qualification of inspection personnel where this is required. The recommended practice does not give guidance of when personnel qualification should be performed – this is an issue to be agreed with the relevant organisations.

This recommended practice is relevant to any non-destructive testing method. Examples given are taken from ultrasonic and eddy current inspections. It is emphasised that the general principles given in this recommended practice can also be used for qualification of manufacturing inspections or of inspections performed in the non-nuclear field, although it was developed with in-service inspection of nuclear power plant components in mind.

The definitions given in the second issue of the ENIQ glossary [2], apply to this recommended practice.

2 Objectives of personnel qualification

The principal objective of personnel qualification is to ensure that those carrying out an inspection are appropriately trained, experienced and examined to ensure it is applied correctly and effectively.

Automated inspections usually involve several stages which may be performed by different personnel: for example, manipulator operators, data collectors and data analysts. It may be necessary to qualify some or all of the personnel undertaking these roles in different ways to demonstrate that they are capable of performing the tasks required of them. Specifically, for automated inspections, it may only be necessary to qualify the data analysts as there may be sufficient checks on the data that an incorrectly mounted manipulator will be clear from the data quality and therefore there is no need to qualify the manipulator operators.

Here it is important to define the difference between personnel qualification and personnel certification. In the context of the ENIQ methodology, personnel qualification is defined as the process that demonstrates that personnel are capable of

implementing a specific inspection or inspections. Certification is defined as the process that demonstrates personnel have the basic skills to implement an inspection method and may not refer to specific procedures. Usually, countries will have their own certification schemes that meet some recognised standard such as EN 473 [3] or ISO 9712 [4]. It is usual for such schemes to have different levels of certification corresponding to the different demands imposed by inspections.

It is necessary, when an inspection procedure is developed, to determine the requirements which the personnel who will carry out the inspection should meet. These should be clearly defined and will be determined by a number of factors:

- Whether the inspection is manual or automated and the different roles fulfilled by different groups of personnel in the latter case
- If the inspection is a manual one, whether the inspection imposes technical demands beyond those examined through a national certification scheme such as those discussed above
- If the inspection is automated, whether it has features which require particular skills beyond those normal for automated inspections

In the case of manual inspections, the inspection itself may be simple and the objectives, in terms of the defects to be detected and the sizing accuracy required, not very demanding. In this situation, the case could be made that the inspector, in obtaining a national certificate of competence, has already demonstrated the required level of competence. Such a certificate requires the inspector to have attended a recognised training course and there are often experience requirements in addition. If all this information is included in the technical justification (TJ) for the inspection, the qualification body (QB) will need to consider whether it is sufficient and whether additional qualification is unnecessary.

Similar considerations apply to automated inspections except that national qualification schemes which determine competence in data collection and analysis are less common, particularly since the detailed personnel requirements are usually very equipment- and system-specific. In addition, there are usually no international standards to which such schemes can be developed and against which they can be assessed. SNT-TC-1A [5] provides for the development of specific certification arrangements relating to a particular inspection using particular equipment. Companies not working to SNT-TC-1A may also use such certification arrangements. However, such schemes are usually developed and implemented within the company carrying out the inspection and so lack independence. If possession of a certificate awarded by a national or company based scheme is cited in the TJ as evidence of competence, it will be necessary for the QB to examine the scheme itself from a number of standpoints to determine whether they can accept such certificates at face value or whether they should be used as the foundation for further qualification:

- Training and experience requirements for candidates
- Written examination questions and pass marks
- Practical examination and its relevance to the inspection in question
- Independence of the assessment process

It is emphasised that, in executing its role in the qualification of personnel, the QB is not responsible for the quality of the actual site inspection.

3 Conduct of personnel qualification

This section discusses the way in which personnel qualification is carried out when it is judged that more confidence than that provided by a national personnel certification scheme is needed. It is assumed, throughout this discussion, that the procedure and the equipment have already been qualified as intrinsically capable of meeting the defined inspection objectives.

The general principles of personnel qualification will be similar for most inspections within each method group, but at the detailed level there will be variations depending on the specific nature of the inspection. Here the TJ plays a very important role in considering all of the features of the inspection and justifies why the proposed training, experience requirements and personnel assessment will ensure that the site inspection procedure is applied reliably. Consequently, the specific method of qualifying the personnel will follow the QB's assessment of the TJ as described below.

3.1 Human factors assessment

The TJ for an inspection should identify any factors which might influence the outcome of the inspection because of their effect on the personnel carrying it out. Such factors might include:

- Difficult access involving working in cramped or precarious conditions
- Obstructions which prevent ready access to all or some of the component under test
- High temperatures or noise levels
- The need to wear protective clothing
- Restricted access times to limit radiation exposure

Problems of the kind outlined above should be minimized wherever possible beforehand but there will often remain some which are intrinsic to the inspection. In such a situation, it is important that any practical trials of the personnel reproduce such factors as closely as possible. If this is not done, there is a danger that the qualification could be unrealistically easier than the real inspection.

3.2 Training

Any trials or written examinations that are carried out can only examine a fraction of the range of knowledge needed to be a competent inspector. Confidence that personnel have the required knowledge base comes from their attendance at a course whose syllabus is sufficiently comprehensive to cover all relevant issues associated with the specific inspection. This may require a training course specially devised and provided for the inspection rather than a more general one. Whatever the utility/inspection vendor determines to be suitable should be justified in detail in the TJ and assessed by the QB.

3.3 Experience

Previous experience in the application of similar inspection techniques to the one under qualification is often judged necessary. The utility/inspection vendor should determine what is required for the particular inspection and justify it in the TJ for assessment by the QB.

Often engineers who develop inspection procedures then go forward as an inspector requiring qualification. Here, some credit may be claimed that the inspection development exercise could replace some of the training (and examination) requirements. Again such arguments should be made in the technical justification.

3.4 Examinations

In certain cases, practical trials alone may not provide a sufficiently rigorous test of the inspector's skills and experience. Written examinations or interviews may therefore help in assessing whether an inspector understands the inspection procedure to be applied. A comprehensive written examination can explore understanding of all aspects of the inspection.

Practical trials are still needed to give the analyst data specific to the particular inspection to interpret and the QB should determine the balance between practical trials and other examination methods.

3.5 Blind trials

3.5.1 General

The essence of a blind trial is that it aims to present an inspector with all the significant problems that he could encounter in a site inspection. Here an analysis of the essential parameters presented in the TJ will identify those aspects of the inspection that should be included during the blind trials. Whilst it is not feasible to directly simulate all of these conditions, their effect should be considered. For example, the impact of many factors can be simulated by imposing time limits on the blind trial.

Such trials can give confidence that the inspector is capable of applying the written procedure as required and can obtain satisfactory results in practice. The need for realism means that blind trial test pieces should replicate the actual component as closely as possible, certainly in terms of those aspects of component geometry which pose the greatest inspection problems. Moreover, a successful outcome from a blind trial gives confidence in the entire system of procedure, equipment and personnel working together.

3.5.2 Blind trial test pieces

This sub-section summarises the basic principles which govern the form that blind trial test pieces should take. Further detailed information is given in Recommended Practice 5 [6].

It is important for the qualification body to use the information presented in the TJ to understand the particular challenges for the inspector and to represent these as far as

possible in the test piece design. This analysis needs to consider all aspects of the inspection from the defect simulations to whether it is necessary to simulate all of the access conditions of the inspection. The following issues should be considered when designing test pieces.

Defects should include worst cases, for example considering:

- those defects which give the smallest responses
- defects in the vicinity of geometrical reflectors where a small defect signal may have to be recognised in the vicinity of a large geometrical echo (It should be noted that it may not be practicable for blind trial test pieces to contain sufficient defects that cover all situations which the inspector might encounter in practice).
- defects which are difficult to size, possibly because they are at long range where beams are widest or normal to the beam so there are no range differences between signals from the defect extremities

However, a range of defect sizes and parameters such as orientation and position will ensure that the inspector's ability is assessed for all the situations he might encounter in practice.

Further issues that should be considered in the design and management of test pieces are:

- Defects should be randomly distributed in test pieces so that any regularity in position cannot be used to guide detection
- Test pieces should include areas where there are no defects. In the case of welds, the weld length can be regarded as being made up of inspection zones long enough to contain a defect which can be detected without interference from defects in adjacent zones depending on the inspection method used and the weld geometry.
- Blind trial test pieces should be stored in a secure area when they are not in use. The area should be accessible only to members of the QB.
- Blind trial test pieces should be uniquely identified in a permanent way. However, such identification should be concealed when test pieces are presented to inspectors in such a way that test pieces which are nominally identical in external appearance are not distinguishable.

3.5.3 Conduct of blind trials

The principles governing the conduct of blind trials are given below. Further information is given in reference 6. A dedicated, securable space is needed to carry out blind trials. For manual inspectors this will contain the test pieces and inspection equipment. For data analysts, the requirement is for office space. In both cases, secure document storage is needed for details of test pieces, data records, candidates' results etc. Secure storage is needed for the blind trials test pieces as discussed above.

Candidates should be briefed by the QB before the trials to ensure they understand the qualification process and how long they have to carry out their inspection. Inspectors should be invigilated continuously by the QB during the trials to ensure there is no collusion between candidates and that no data is removed from the examination area. This might be either paper records or data recorded on digital inspection equipment.

During blind trials, the QB must ensure that inspectors are applying the procedure correctly. The time allowed for the inspection of each test piece must be related to any time restrictions applicable to the real inspection. However, care must be taken in setting time limits as the number of defects the inspector must detect and size will exceed any he is likely to encounter in practice. Consequently, the time allowed for each test piece must provide for this. An estimate of the time needed can be obtained by using an experienced inspector to apply the procedure and then adopting the time he found to be necessary.

3.5.4 Detection assessment

For assessment of detection, the total number of defects an inspector is presented with in blind trials is arbitrary. The defect population needs to include both worst-case and non-worst case as discussed above. There should be a significant length of un-flawed material so that inspectors cannot rely on seeing defect signals from all parts of the test piece. Such un-flawed sections also assess the ability of the inspector to avoid reporting false calls.

While the total number of defects is arbitrary, there should be a sufficient number, covering a range of defect parameters, to give confidence in the ability of the inspector to detect defects reliably (or for a data analyst to identify all defects in the recorded data in the case of automated inspections). If the defect population is small, any failures would provide relatively low confidence in good detection ability. Similarly, the number of allowable false calls should be set at a level that reflects the requirements of the inspection objectives and the volume of material seen by the inspector in the blind trial.

If it is desired to qualify several inspectors at the same time, sufficient test pieces should be available for this. There should be a greater number of test pieces than the number of inspectors so that some can be held in reserve. If there are no distinguishing features on the exterior of the test pieces, inspectors would not know if they were inspecting the same test piece as another inspector may have been given earlier in the trials. Such anonymity adds greatly to confidence that collusion between inspectors has not benefited any of them. Any test piece identification marks should therefore be blanked out during the trials. Collusion during the trials themselves can be avoided by supervision by the QB but measures of the kind discussed above are necessary to minimise the benefits of any collusion outside the examination area.

3.5.5 Sizing and positioning assessment

As stated above, when personnel are qualified, the procedure and equipment will normally already have been qualified through a combination of TJ and open trials. Qualification of the procedure and equipment will normally have established the sizing and positioning accuracy and whether this meets the requirements set out in the inspection objectives. Assessment of inspectors then involves determining whether

they have achieved either the performance which the inspection is capable of or the inspection objectives.

3.6 Conclusion

3.6.1 Information to be included in the qualification dossier

- The reasoning of the QB for determining the particular form of personnel qualification carried out. This will involve an explanation of why the difficulties posed by the inspection for personnel are appropriately assessed by the qualification approach used.
- Information for each inspector relating to prior certification requirements and experience. These should meet the requirements specified in the inspection procedure.
- Information on written examinations carried out and results for each inspector.
- Information on blind trial test pieces used. If it is intended to use the test pieces again, then information about the defects must be restricted. If the dossier is to be public, only outline information can be included that would be of no benefit to anyone being examined in the future using these test pieces.
- Performance achieved by each inspector/analyst in detection. This should include the number of defects presented to the inspector together with margins of detection achieved and information about any false calls recorded.
- Performance achieved by each operator in sizing/positioning. Comparison with accuracies demonstrated to be possible in procedure/equipment qualification and with the requirements of the inspection objectives.
- Examination papers and inspection reports produced by candidates

3.6.2 Activities following qualification

- The procedure may need to be modified after blind trials if these reveal any difficulties relating to the ability of inspectors/analysts to carry out the procedure in practice. If any changes are in fact made to the inspection procedure then supplementary personnel qualification may be necessary.
- The performance of failed inspectors should be fed back so that appropriate re-training can be done.
- Failed inspectors should be re-tested using different test pieces to the ones inspected previously.

4 Renewal of personnel qualification

The qualification assigned to an inspector will expire following a pre-determined length of time and there may be the need for such qualifications to be renewed. In addition the procedure may undergo some modifications that would require some action to be taken regarding the personnel qualification. In both instances it is usually not necessary for personnel to go through the whole of the original qualification processes. This section describes some of the principles by which the qualification renewal process should be conducted.

Where modifications to the inspection procedure have been made since the original personnel qualification, the QB should come to a judgement of the significance of such modifications. In many cases it will be judged that the modifications will have no significant bearing on the skills and experience needed to perform the inspection and that the personnel qualification can simply be re-issued to refer to the latest version of the procedure. Where the inspection procedure modifications are judged to be significant, for example a new defect sizing technique may have been added, then some limited, additional personnel qualification may be needed. It is expected that a TJ will be produced along with the modified procedure to justify the technical changes and such a TJ should also justify the proposed method of retraining and reassessment for personnel.

The other case where requalification of personnel may be needed is when the original personnel qualification has expired. Here the principles for defining what renewal activities may be needed are:

- The ongoing involvement of the inspector in the specific inspection could be used to reduce the activities of the renewal process. For example, if, following the original qualification, the inspector has been performing the inspection on a regular basis, and there is some evidence of his performance during this interval, then it may be acceptable for the QB to extend the inspector's qualification for a further interval. Here the proposals for renewal should be made by the employer/plant operator and assessed by the QB.
- The inspector may not be directly applying the specific inspection for which the renewal is sought but is involved in similar inspections on similar plant. Evidence of this experience could be used by the employer/plant operator to reduce the scope of any qualification renewal activities. For example, the renewal process could consist of refresher training with a simple practical demonstration of the inspector's capability.
- In the case where the inspector has not been routinely involved in applying the specific or similar inspections, then the full range of activities undertaken during the original qualification may be necessary.

5 Roles and responsibilities

The judgement on what form of personnel qualification, if any, is appropriate will be made in the first instance by the plant owner/vendor. Whatever decision is reached will need to be justified and the reasoning included in the TJ. This will include an analysis of the difficulties of the inspection for personnel and the reasons why the approach to demonstrating personnel competence is appropriate to these problems.

The role of the employer/plant operator is to:

- Propose personnel qualification/certification requirements and justify these in the TJ
- Provide records of personnel to be used including certification possessed and experience. Personnel records should also include any internal training or certification courses completed.
- Determine inspection-specific training requirements and implement these
- Determine additional training requirements for inspectors who fail their initial attempt

The QB will assess the TJ and determine if specific personnel qualification is necessary and, if so, what form it should take. The QB will also assess the pre-requisite certification and experience requirements stipulated in the inspection procedure and determine whether these are sufficient. This will be done as part of the assessment of the TJ.

In summary therefore, the role of the QB is to:

- Assess the TJ and judge whether personnel qualification is necessary or whether personnel certification or employer-based training and/or certification is sufficient
- Assess whether the training and experience pre-requisites defined in the inspection procedure for personnel certification are sufficient
- If qualification is judged necessary, define how personnel will be qualified and set this out in the qualification procedure
- Witness training
- Conduct any written examinations
- Design blind trials test pieces
- Conduct blind trials
- If inspectors fail, provide feedback on performance to the utility so that further training can be addressed.
- Maintain security of information.
- Administer secure storage of blind trial test pieces.

It is emphasised that, in executing its role in the qualification of personnel, the QB is not responsible for the quality of the actual site inspection.

6 Personnel qualification records

A record of successful candidates should be issued and maintained by the QB. This record, which is usually in the form of a certificate issued to the inspector or as stored information in a database, should contain the following information:

- The inspector's name and company affiliation
- The inspection procedure and function for which he is qualified
- The qualification procedure used to qualify him
- The duration of validity of the qualification
- Any continuing training or regular practical application requirements to maintain the validity of the qualification
- The means by which the qualification is renewed following its expiry
- Grounds for withdrawal of qualifications
- Any caveats or restrictions on the personnel qualification, for example the inspector may pass detection and not sizing.

7 References

1. European Methodology for Qualification of Non-Destructive Testing, Issue 3, ENIQ Report 31, EUR 22906 EN, published by the European Commission, Brussels-Luxembourg, 2007.

2. ENIQ Glossary, Issue 2, ENIQ Report 12, EUR 18102 EN, published by the European Commission, Brussels-Luxembourg, 1999.

3. Qualification and Certification of NDT Personnel: General Principles, European Standard EN473, 2008.

4. Non-Destructive Testing – Qualification and Certification of Personnel, International Organisation for Standardisation, Standard ISO 9712, 2005.

5. Recommended Practice No. SNT-TC-1A: Personnel Qualification and Certification in Nondestructive Testing, 2006.

6. ENIQ Recommended Practice 5: Guidelines for the Design of Test Pieces and Conduct of Test Piece Trials Issue 1, ENIQ Report 14, EUR 18686 EN, published by the European Commission, Brussels-Luxembourg, 1999.

APPENDIX 1 – Overview of published ENIQ Recommended Practices

RP1	Influential/essential parameters, EUR 21751 EN
	ENIQ Recommended Practice 1 should assist those involved in inspection qualification in how to use and implement the concept of influential/essential parameters in agreement with the spirit of the European methodology. This version of RP 1 – Issue 2 – builds upon the experience gained in the use of Issue 1 since it was published in 1998. The main objectives of this Recommended Practice are: - to explain the concept of influential/essential parameters - to indicate how the concept can be used in inspection qualification according to the European methodology - to give advice concerning the classification of influential parameters - to give examples of parameters which can be influential as a function of the specific inspection to be qualified for two cases: an ultrasonic inspection of welds and an eddy current inspection of steam generator tubes.
RP2	Strategy and recommended contents for technical justifications, EUR 24111 EN
	This ENIQ Recommended Practice 2, describing the purpose of TJs and defining a list of recommended contents for writing them, is a combination of two previous recommended practices, RP2 and RP3 which separately dealt with the issues of TJ contents and TJ strategy. It should assist those producing TJs to identify the role of the TJ and the material that might be included. It should also assist in producing TJs in a uniform format throughout Europe.
RP3	Merged with RP2
RP4	Recommended contents for the qualification dossier, EUR 18685 EN
	This RP should assist those doing qualifications to identify the material which might be included in the qualification dossier, which is defined as an assembly of all the information relevant to the definition and execution of the qualification. It should also assist in producing qualification dossiers in a uniform format throughout Europe, an essential element in providing a general framework for a scheme of recognition of qualifications performed in the EU. Note that the concept of dossier is not that of a single document or report but rather that of a file in which key documents of the qualification are inserted.

RP5	Guidelines for the design of test pieces and conduct of open trials, EUR 18686 EN
	The purpose of RP5 is to provide guidelines for the design of test pieces and the conduct of test piece trials, once it is has been decided (for example, as a result of the analysis done in the technical justification) that they are required. It refers especially to those test piece trials (open or blind) that are supervised by the qualification body.
RP6	The use of modelling in inspection qualification, EUR 19017 EN
	This RP deals with the use of mathematical modelling in inspection qualification. Mathematical models have been developed by several organisations for various inspection situations and, where applicable, can provide valuable evidence on inspection capability for inclusion in a technical justification. Authors of technical justifications may therefore be considering the use of models. This RP provides advice on: - the types and range of mathematical models which are available - how the models can be used to generate evidence for a technical justification - important considerations and constraints in using models.
RP7	Recommended general requirements for a body operating qualification of non-destructive tests, EUR 20395 EN
	The document provides guidance on the minimum criteria that a body operating qualification of non-destructive testing should follow if it is to be recognised as impartial, independent of operational pressures, competent and reliable. Three types of qualification body are considered within the RP: Type 1: A qualification body which is an independent third party organisation Type 2: A qualification body which is an independent part of the utility's organisation set up on a permanent or long-term basis Type 3: An ad hoc qualification body set up for a specific qualification. The RP is mainly intended to provide guidance on the requirements for qualification bodies of types 1 and 2. An ad hoc qualification body, type 3, being more temporary and inspection-specific in nature, will generally be established in a less formal way than qualification bodies of types 1 and 2. However, many parts of the RP should still provide useful guidance for setting up an ad hoc qualification body. The RP should assist those who want to establish a qualification body and those who have to audit the competence of a qualification body. It should also assist in providing a general framework for a scheme of recognition of qualifications performed in the European Union (EU).

RP8	Qualification levels and qualification approaches, EUR 21761 EN
	This RP is intended to provide guidance on the setting of Qualification Level and on determining the Qualification Approach based partly on this choice of level. The Qualification Level required reflects the assurance required that the inspection will attain its objectives in demonstrating structural integrity and may depend on e.g. the safety significance of the component and the role of the inspection in assuring structural integrity. In practice, qualification can be done with varying degrees of complexity and cost. The way such work is carried out is defined in this document as the "qualification approach", and needs to take into account both the structural integrity significance and the difficulty of each specific inspection. The qualification approach determines to what extent the various aspects of qualification, i.e. technical justification, open trials, blind trials etc., are included in a particular case.
RP9	Verification and validation of structural reliability models and associated software to be used in risk-informed in-service inspection programmes, EUR 22228 EN
	Structural Reliability Models (SRMs) are commonly used to evaluate failure probabilities in the development of Risk-Informed In-Service Inspection (RI-ISI) programmes. This report summarises the Verification and Validation (V&V) requirements that a Structural Reliability Model (SRM) and associated software should satisfy in order to be suitable for such purpose. These requirements are mainly based on the work performed within the NURBIM project.
RP10	Personnel qualification, EUR 24112 EN
	This RP is meant to assist those involved in the qualification of inspection personnel to meet the principal objective of personnel qualification, i.e. to ensure that those carrying out an inspection are appropriately trained, experienced and examined to ensure it is applied correctly and effectively. Detailed guidance on how to conduct personnel qualification, handle qualifications to be renewed, and defining the role and responsibilities of the parties involved in the personnel qualification process is provided.

RP11	Guidance on expert panels in RI-ISI, EUR 22234 EN
	The European Framework Document for Risk-Informed In-Service Inspection is intended to provide general guidelines to utilities on how to develop RI-ISI approaches and use or adapt already established approaches to the European nuclear environment, while taking account of utility-specific characteristics and national regulatory requirements. The Framework Document recommends the use of an expert panel to review the selection of safety-significant sites before the inspection programme is finalised. However, more detailed guidance regarding the responsibilities, composition and working procedures of an expert panel is not provided. This ENIQ recommended practice is meant to assist users of RI-ISI applications in how to form, prepare and facilitate an expert panel whose final goal is to take decisions concerning the inclusion or exclusion of sites from the risk-informed inspection programme. A recommended practice is a document produced by ENIQ to support the higher level Framework Document. Users are free to use these recommended practices at national level, as they see fit. The main objectives of this recommended practice are to give guidance on: Composition of the expert panel; Responsibilities of the expert panel; Planning and preparation of the expert panel; Conduct of the expert panel; Documentation of the expert panel.

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Abstract
This Recommended Practice is meant to assist those involved in the qualification of inspection personnel to meet the principal objective of personnel qualification, i.e. to ensure that those carrying out an inspection are appropriately trained, experienced and examined to ensure it is applied correctly and effectively. Detailed guidance on how to conduct personnel qualification, handle qualifications to be renewed, and defining the role and responsibilities of the parties involved in the personnel qualification process is provided.

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